LETTERS TO THE EDITOR.

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Secular Changes of Climate.

FOR some time past it has been generally believed that the climate of Central Asia was once less arid than at present, but we now know, as Dr. Sven Hedin explained to the Royal Geographical Society on December 8 (p. 134), that important changes have taken place since the Christian era began. He found in the Lob Nor region forests with the trees long dead, traces of a road, ruined villages, coins, manuscripts and other relics which proved the northern shore of the old salt lake (now dry) to have been cultivated and occupied, down to about sixteen centuries ago, by a fairly civilised people. This, I think, implies a rainfall, less inappreciable than the present one, during the earlier centuries of that era, and the change, as he found dead forests, cannot be attributed (as in parts of southern Europe and Syria) to reckless destruction by the hand of man. But, besides this, Sir Norman and Dr. W. J. S. Lockyer have recently proved (in a communication to the Royal Society) a very remarkable correspondence to exist between the distribution of the periodic rains in India, Mauritius and elsewhere and the amount of solar activity, and they have, within the last few days, drawn the attention of the same Society to the fact that zones of abnormally high and low mean barometric pressure exist on opposite sides of the earth and oscillate from the one position to the other in accordance with the periodic small variations of solar activity. Dr. Sven Hedin's discovery apparently indicates a change secular rather than periodic, but may not both operate independently, as in the case of changes due to variations of eccentricity in the earth's orbit and to precession of the axis of rotation? The authors of those papers admit the existence of disturbing causes, some of which may be local, but not necessarily all. Is it, then, possible that these discoveries may afford a clue to the solution of two great geological puzzles—the abnormal temperatures of the Pleistocene and of early Tertiary times? In regard to the former, many now believe that the climate of North Central Europe when the loess was deposited more nearly resembled that of the Caspian steppes, and all maintain that in the Glacial epoch the mean temperature of the whole continent was much below what it is now. How much this was, at the time of greatest cold, is not easily estimated, but a few years ago I attempted a rough approximation. This will be found in a volume of the Contemporary Science Series called "Ice Work" (part iii. chap. i.), and the results (for Europe) are as follows:—Supposing the British Isles to be at their present level (in order to avoid the controversy as to the origin of Boulder-clays and Glacial gravels), the mean temperature of these islands at the present Ordnance Datum would have to be lowered by about 20° F. The same would probably hold good of Scandinavia—at any rate, that would suffice to make either country much more closely resemble a corresponding part of Greenland. In the more central parts of Europe, the problem is rather easier, for here we are undoubtedly dealing with "land-ice." A fall of 18° in the mean temperature would suffice for the Alps; perhaps rather less, 15° or 16°, for the Pyrenees, the Sierras Guadarrama and Nevada, possibly also for the breccia-producing age on the Rock of Gibraltar. A reduction of 18° at most, and more probably about 16° or 15°, would bring back small glaciers to Auvergne, the Schwarzwald, Vosges, Apennines, Corsican mountains, the Caucasus and even the Atlas. I may add that a reduction of 15° appears sufficient to form a great ice-sheet in North America, and that in the southern hemisphere and at Mount Kenya in Africa distinctly smaller change suffices. All these estimates assume the present levels maintained; they may be corrected at the rate of 1° for each 300 feet of elevation or depression. But geologists too often forget that the anomaly of early Tertiary heat is not less difficult to explain than that of Pleistocene cold, for in later Eocene ages the mean temperature of southern England can hardly have been less than 20° above that which it now enjoys. The explanations which have been offered for the Glacial epoch —a different arrangement of sea and land, variations in eccentricity, precessional movements (none of which, in my opinion, are more than partially successful)—cannot be applied to the latter case, so that we seem compelled to seek for some other cause. Variations in solar heat have been already suggested, but hitherto this hypothesis has seemed too much a *Deus ex machinâ*. But as Dr. Sven Hedin's discoveries show that important alterations in climate have been in progress during the last fifteen or sixteen centuries, and Sir Norman Lockyer's researches indicate that comparatively small changes in solar activity produce rather important meteorological effects upon the earth, geologists qualified for the investigation may find it not unprofitable to follow up the clue. T. G. BONNEY.

The Government Grant for Scientific Research.

NOW that the annual advertisement of the Government grant is once more appearing, I should like to call attention to the long interval that elapses between the date appointed for the reception of applications for, and that of making known the distribution of, the grants. The former is fixed for January 31, the latter is some time in May, a period of more than three months. This seems to me to detract somewhat from the value of the grants, for, in certain instances at least, the conditions may have quite altered in so long a time and the possibility of making a particular research have passed away.

King's College, December 8. R. T. HEWLETT.

The Unconscious Mind.

IN a recent review (November 20) of my book on the "Force of Mind," "W. McD." remarks, "The book is vitiated throughout by the insistence upon the part supposed to be played by the unconscious mind."

But a closer attention to the argument would have revealed the fact that, while no stickler for a word and still less an advocate for two minds, the author is compelled to give some name for mental processes unaccompanied by consciousness.

The position of the man who denies any mental processes at all, as distinguished from mechanical, is logical; but the position of the man who distinguishes mental processes (that is, processes which a machine cannot conduct apart from mind) from mechanical, and at the same time will only recognise as mental those accompanied by consciousness, is illogical. The self-same mental process at one time may be conducted in consciousness and at another outside it, and he is therefore on the horns of this painful dilemma. He must either at one time call the process mental and at the other mechanical or "nervous," or he must extend the word "consciousness" so as to include the unconscious. To a psychologist, the consequences of such a theory are deplorable and are described in scathing terms by Prof. James [1] when he depicts the present state of this conservative science; while with a medical man it compels him logically to regard cases of neuromimesis as malingering or fraud because he sees the disease has mental characteristics, and yet cannot, according to the old psychological shibboleth, recognise as mind the unconscious psychic agent. I may say in conclusion that the need for this extension of mind has been felt by none more keenly than by the very psychologists who have refused it. The student of this subject has only to turn to Prof. C. T. Ladd's "Philosophy of Mind," p. 395, and compare it with p. 393; or to Prof. Sully's "Illusions," pp. 266 and 335, to see the existence of unconscious mental actions both asserted and denied in the same book.

These passages and others will all be found in my work [2] on the subject. A. T. SCHOFIELD.

6 Harley Street, W., December 15.

DR. SCHOFIELD objects to my strictures on his extensive application of "the unconscious" as an explanatory principle that solves (for him) all problems of the relations of body and spirit. And he persists in confusing the question of the validity of "the unconscious" with the question of the propriety of so extending the use of the terms "mind" and "mental" as to make them applicable to brain activities that do not involve affections of consciousness. This extended use of the words I myself, following Dr. Bastian, have urged and adopted, but to do this is not to commit oneself to the hypothesis of "the unconscious mind." Dr. Schofield's use of this phrase implies the assumption of a factor in mental life that is neither neural process nor conscious process, but an utterly unknown, unknowable and mysterious third agent, more or less intervening between the two

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[1] Prof. W. James, "Psychology," p. 468.

[2] Dr. Schofield, "The Unconscious Mind," 2nd edition. (Hodder and Stoughton.)

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known processes. This I hold to be a radically vicious hypothesis, not merely because it is unverifiable (for, in spite of the dictum of J. S. Mill, that appears to be an insufficient ground for condemnation), but (1) because it invokes an agency of an absolutely unknown order, (2) because it is not necessary and does not help us to give a consistent description of the facts, (3) chiefly because it serves merely as a cloak disguising our ignorance and must tend to make those who adopt it content to remain ignorant. Dr. Schofield's position seems to be based solely on the following argument:—

The human organism exhibits activities that cannot be shown to be accompanied by corresponding states or processes of consciousness, but which nevertheless display so great a complexity and nicety of adjustment of means to ends that we cannot suppose them to be carried out by the agency of neural processes only; therefore we must assume an agent that plays a part similar to that which we assign to consciousness, but differing from it merely in not being consciousness. But when many of our leading thinkers accept the view so clearly enunciated by Huxley in his essay on "Animal Automatism," the view, namely, that all human activities are carried out by the agency of neural processes without the causal intervention of any other factor, consciousness being an epiphenomenon merely, why should Dr. Schofield believe himself competent to draw a line at any particular degree of complexity of behaviour, saying "So much can the unaided neural processes accomplish, but no more."

W. McD.

THE UNIVERSITY OF LIVERPOOL.

IN 1879, Dr. Lightfoot, speaking at a prize-giving in Liverpool, described as seen in a dream its future University College. The speech had no small influence in securing the foundation of the College, and twenty-three years have done much to realise the dream.

The progress of University College has been most striking; it started in 1881 with seven professorships and three lectureships. Now there are twenty-one professorships each endowed with the sum of 10,000*l.* and one temporarily endowed. The total number of professors, lecturers and assistants is seventy-two, and the value of the endowment about 226,000*l.*

Practically all of this has been given by citizens of Liverpool, much in single sums of 10,000*l.*, for the founders, inspired by Mr. Rathbone, were wise men, and realised that they were providing for a large need and must do it on a large scale.

The value of the College site and buildings already erected is about 280,000*l.*, while 50,000*l.* from the fund recently raised is to be spent immediately in further buildings. For scholarships, prizes, the maintenance of laboratories and of the Day Training College, about 60,000*l.* has been invested; a capital sum of more than 600,000*l.*, contributed in twenty-three years by Liverpool benefactors for the advancement of learning and for the education of their townsfolk.

Besides this, large sums are given voluntarily each year for annual expenditure. The city shows its interest in a practical manner by the grant it makes towards certain of the technical classes, while the fees received from students last year reached 13,000*l.* These results, though they may seem small compared with some of those achieved through individual generosity in America, are splendid. The Bishop's dream is nearly realised.

Now the men who have done this come forward and say that it is necessary for the future success of their work that the union which exists between the three colleges of the Victoria University should be dissolved, and that Liverpool should have its own University. Can anyone gainsay their right to speak or urge that they are not the best judges of their case?

They speak with no uncertain voice. The Education Bill transfers to the City Council the control of education in the city, and the Council is of opinion that a University of Liverpool is necessary as the keystone of the arch it intends to build; it has already received power to raise a rate for university education if a Charter is granted to University College, and it intends to do it. It is inconceivable that that Charter should be refused, that the Government, which has indicated its wise desire to leave freedom wherever possible for the development of education according to local needs, should refuse the request of one of the greatest of the local authorities of the country, the Corporation of Liverpool, to complete its work by establishing a "great university for a great city." These were the words used by Mr. R. B. Haldane at a city dinner in Liverpool some four years since; it was clear from their reception then that the ideal he put forward appealed strongly to the representative gathering which he addressed, and in the joint petition of the City and University College for a Charter which is now before the Privy Council we have the outcome of his words.

The case is one which carries conviction as it is read. The grant, it is urged, would greatly stimulate the development and increase the influence of University College and other institutions for the promotion of higher education in the city; it would bring higher education into closer connection with the professional and commercial life of the city; it would provide a true university education for many who cannot leave home to obtain it—the promoters urge with success the distinction between education in a university college, a part of a federal university, and that in a university—it would stimulate research by multiplying in the proper places the centres at which this can be carried on, and, having regard to the inadequate provision of the higher forms of education in England relatively to foreign nations, would be for the benefit of the nation as a whole.

Each of these claims is substantiated by solid facts.

The success of the movement will mean the dissolution of the Victoria University in its present form.

To this, Owens College, the predominant partner in the federal University, has given a ready consent; the two great cities of south-west Lancashire are at one in the belief that each may well be the centre of an independent university, and the case for Owens College is in many ways stronger than that for Liverpool. Yorkshire College, on the other hand, wishes to retain the present system. The financial position of Yorkshire College is much weaker than that of her sister colleges; Mr. Lupton at Leeds in January last said, when speaking of the number of its students, "It will compare favourably and creditably with the other two colleges of the University, but in its material assets it is ludicrously wanting. In the capital of the College, the assets are between 250,000*l.* and 300,000*l.*, but the money has been spent on buildings, apparatus, &c. Of invested capital, we have not quite 39,000*l.*, the income of which goes to the annual expenditure of the College."

At present, then, Yorkshire College is less fitted than the others to become a university, hence in part its dislike at being left alone. But Yorkshiremen are quite able, as was stated by the Principal of the College and the Bishop of Ripon at the same meeting, to create a university of their own if the need for it arises, and it will be found in Leeds no less than in Liverpool that a great university is a great power for good and for advancement.

To Liverpool and Manchester, the failure of the petition would be disastrous; it would curb enthusiasm, it would check the flow of benefactions for education, it would discourage men whose whole heart is in the great work they have set themselves to do, to build in each of these two cities a university which they feel is needed for the highest training of men and women in whose hands the future rests; it would compel two responsible bodies who have each decided that it can best perform its allotted duties separately to endeavour to struggle on in a union which they feel is hopeless.

All this is clear to anyone reading the case presented, so clear that of the issue there can surely be no doubt.

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